D-16 Physico-chemical condition of Headwater streams of 4 major rivers of Sri Lanka

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Physico-chemical parameters in the headwater streams of the rivers Mahaweli, Kalu, Kelani and Walawe were measured over one and half years by monthly sampling. Sampling area of the Mahaweli river was located in the regions of Nuwara Eliya. Horton Plains and Knuckles. Sampling area of the Kelani river was located in the western (Maliboda sector) and northern (Frogmore sector) part of the Peak Wilderness sanctuary. Sampling area of the Walawe river was situated at southern part of the Peak Wilderness sanctuary (Non pareil-Nagarak and Balangoda sector). Sampling area of Kalu river was located in the South-West part (Carney sector) of the Peak Wilderness sanctuary.

Samples were obtained monthly at each station, between January 1993 and April 1994. Two water samples from each station were collected in polyethylene bottles and chemical analysis was done in the laboratory. The concentrations of Na^+, K^+, Ca^{2+}, Fe^{3+} of the samples were investigated using an atomic absorption spectrophotometer. Alkalinity was measured titrimetrically with 0.05N HCl using methyl orange and phenolphthalein as indicators. The concentrations of NO_3^- and NO_2^- were determined using a flow injection analyzer which was connected to a spectrophotometer. PO_4^{3-} concentrations of the water samples were measured using a spectrophotometer. The level of turbidity was measured using a turbidity meter.

Some physico-chemical parameters such as conductivity, pH, temperature, velocity of water flow were measured at each station, using a conductivity meter, portable pH meter, thermometer and a flow meter respectively and Free CO_2 concentration of the water samples was estimated by titrating with carbon dioxide free standard sodium bicarbonate solutions using phenolphthalein as indicator.

It was observed that all the running waters in the study area exhibited a low concentration of dissolved minerals and are slightly acidic. In general the temperature, conductivity, alkalinity, pH, turbidity and the concentration of Ca^{2+}, Mg^{2+}, NO_2^-, NO_3^- and PO_4^{3-} of streams and rivers increase with decreasing elevation, while these factors show higher value in lentic waters than in lotic waters. But when the streams flow through cultivated and settlement areas, the concentration of above ions shows higher values than in natural forest areas.